

**DISCUSSION DOCUMENT
PROPOSED MODIFICATIONS TO THE
SOLID WASTE MANAGEMENT FACILITY REGULATIONS
310 CMR 19.000**

May 24, 2004

I. INTRODUCTION

The Department of Environmental Protection is proposing modifications to the Solid Waste Management Facility Regulations, 310 CMR 19.000. These regulations modify several sections of the Solid Waste regulations to eliminate old, outdated sections, revise the standards for liners from a single composite liner to a double composite liner, require risk evaluations for new or expanding facilities, add certain construction and demolition waste materials to the waste bans, rewrite the Beneficial Use Determination regulations, and to make several other modifications.

All interested parties are encouraged to submit either written or oral comments during the public comment period, which will end on [DATE]. During this comment period DEP will hold public hearings in several locations as described in the enclosed notification. Specific issues or questions on which DEP seeks comment are presented in ***bold italics*** in this document.

To submit written comments or obtain further information, please contact:

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II. ORGANIZATION OF PUBLIC HEARING PACKAGE

The enclosed regulatory review package contains the following documents:

1. Proposed modifications to the Solid Waste Regulations, 310 CMR 19.000. The proposed modifications to the existing regulations are indicated in the document by showing text to be added with double-underline and showing ~~text to be deleted with a line through it~~. **This document only includes those sections of the Solid Waste Regulations for which modifications are being proposed. It may be necessary for the reviewer to refer to the existing Solid Waste Regulations for definitions or references to other sections of the regulations that are not proposed for modification. The existing Solid Waste Regulations are available on the Department's web site at:**

<http://www.mass.gov/dep/bwp/dswm/dswmpubs.htm> - regs

2. The discussion document, which provides the background and reasons for the regulatory changes being proposed to the Solid Waste Regulations. Where the Department is specifically requesting comment on a particular issue, that request will be highlighted in ***bold italics***.

III. MODIFICATIONS TO THE SOLID WASTE MANAGEMENT FACILITY REGULATIONS, 310 CMR 19.000

HISTORY OF THE SOLID WASTE REGULATIONS

The Solid Waste Management Facility Regulations (solid waste regulations) were first promulgated in 1971, consisting mostly of operation and maintenance requirements for landfills. The regulations were completely rewritten to their present form and promulgated in 1990. The expanded scope of the 1990 regulations covered application requirements for all types of solid waste management facilities that require permits from the Department and included design and performance standards, operation and maintenance requirements, closure and post-closure requirements, monitoring requirements and financial assurance requirements for landfills. Minor modifications to the 1990 regulations were made in 1992, 1994 and 1998, including folding the old transfer station regulations (310 CMR 18.00) into the Solid Waste Regulations. The most recent change in 1998 added Cathode Ray Tubes (CRTs) to the list of disposal ban materials at 310 CMR 19.017 and expanded the waste bans to transfer stations.

Since the current Solid Waste Management Facility Regulations were issued thirteen years ago, only the minor modifications noted above have been made to them. The permit application requirements, review criteria, landfill design, performance and operational standards, and Beneficial Use Determination sections have not been modified since 1990.

WHY THE SOLID WASTE MANAGEMENT REGULATIONS ARE BEING REVISED

In the Beyond 2000 Solid Waste Master Plan, the Department committed to revising the solid waste regulations specifically to incorporate new standards for double liners for new landfill areas, add a risk evaluation criterion to both the Site Assignment Regulations, 310 CMR 16.00, (this was accomplished in June 2001), and the Solid Waste Management Facility regulations, revise the Beneficial Use Determination (BUD) regulations and add unprocessed construction and demolition waste to the list of banned wastes.

In addition to those issues raised in the Beyond 2000 Solid Waste Master Plan, the solid waste industry asked the Department to consider eliminating the municipal waste combustor (MWC) ash monofill requirement, allowing co-disposal of MWC ash with municipal solid waste. Since 1987, first through policy and then regulation, ash from municipal waste combustors has been required to be disposed in ash-only landfills or monofills.

In addition, several sections of the regulations addressing transitional requirements for facilities that were permitted prior to 1990 are no longer needed and can now be deleted from the regulations, which will result in some streamlining of the regulations.

The six major revisions proposed for the Solid Waste Management Facility Regulations include:

- increasing the level of protection to public health, safety and the environment by revising the landfill liner standards to a double composite liner design standard;
- adding several materials normally found in construction and demolition waste to the list of materials banned from disposal;
- incorporating the same risk evaluation criterion adopted in the Site Assignment Regulations in June, 2001;
- completely revamping the Beneficial Use Determination regulations to tailor the application and review process to the category of use to which a waste material is to be put and to the level of risk posed by the use;
- eliminating the ash monofill requirement for ash landfills; and
- eliminate the sections of the regulations that were time sensitive and are now obsolete.

Finally, one change to the regulations that was proposed in the Beyond 2000 Solid Waste Master Plan that is not being proposed is the requirement for a Recycling Benefits Plan (RBP). The Department discussed various options for adding RBPs to the regulations with a subcommittee of the Solid Waste Advisory Committee at a number of meetings. It became clear, based on these discussions, that the cost to implement an RBP program, which would be passed through to customers, outweighed the potential benefits of such a program. Therefore, the Department decided not to pursue this change at this time.

SECTIONS OF THE SOLID WASTE REGULATIONS BEING REVISED

The following sections of the Solid Waste Management Facility Regulations are proposed for revision:

- Definitions **(19.006)**
- Waste Bans **(19.017)**
- Permitting requirements **(19.020 – 19.038)**
 - Application requirements **(19.030)**
 - Applicability and review criteria for permits **(19.038)**
- Beneficial Use Determinations **(19.060)**
- Special Waste **(19.061)**
- Demonstration Projects or Facilities **(19.062)**
- Ground water protection system design and performance standards **(19.110 – 19.111)**
- Ash monofill requirements **(19.119)**
- Landfill operation and maintenance standards **(19.130)**
- Environmental Monitoring Requirements **(19.132)**
- Handling Facility Regulations **(19.201 – 19.221)**

PROPOSED REVISIONS TO THE REGULATIONS

1. Definitions (19.006)

The proposed regulations contain a number of revisions and additions to the definitions section of the regulations. Many of these changes are to bring the definitions in these regulations into

line with recent revisions to the same definition in the Site Assignment Regulations, 310 CMR 16.00 and other DEP program regulations. Several new definitions are proposed as a result of revisions to the Waste Bans, the Beneficial Use Determination (BUD) regulations and liner standards. For the purpose of this background document the definitions associated with the Waste Bans, the Beneficial Use Determination section and the Double Liner requirements are included in the sections discussing those revisions. Other definitions appear below.

The modifications proposed to each of the following definitions will make these definitions consistent with the definitions included in the recently revised Site Assignment Regulations, 310 CMR 16.00 and to revisions proposed for the Air Quality Regulations, 310 CMR 7.00.

Abutter

Interim Wellhead Protection Area (IWPA)

Site Assignment

Watershed

Zone A

Zone B

Zone C

Zone of Contribution

Zone I

Zone II

Asbestos Waste

The definition of asbestos waste is proposed to be modified to simply refer to the definitions of Asbestos Containing Material and Asbestos Containing Waste Material that are defined in the Air Quality Regulations at 310 CMR 7.00. This will maintain consistency between the solid waste and air quality regulations where those definitions may change.

Construction and Demolition (C&D) Processing Facility

There is no definition of Construction and Demolition Processing Facility in the Solid Waste Regulations. Massachusetts now has approximately 10 C&D processing facilities.

2. C&D waste ban (19.017)

The Department proposes to revise 310 CMR 19.017, Waste Control, to add definitions for each of the banned materials that were defined in the waste ban guidance document, and add asphalt pavement, brick, concrete, metal and wood to the list of restricted materials, effective nine months after the effective date of these regulations. In addition, it is proposed to rename the title of this section from “Waste Control” to “Waste Bans” because this is the terminology generally in use.

Introduction

The proposed amendment to the Waste Bans is consistent with the Commonwealth of Massachusetts Beyond 2000 Solid Waste Master Plan’s (SWMP’s) goal of reducing non-municipal solid waste by 88% by 2010. To reach this goal, the DEP proposed in the SWMP to increase recycling or beneficial uses of construction and demolition (C&D) waste by banning the disposal of unprocessed C&D waste in the year 2003. The SWMP states that DEP will consider

delaying the ban beyond 2003, if the processing capacity is not in place or other factors indicate a ban would not be feasible or effective by 2003. The current proposal in the draft regulations is to establish the effective date of the new bans 9 months after the final promulgation date of the regulations to give facilities time to prepare modifications to their waste ban plans and submit them to the Department for review and approval. The regulations will require submittal of waste ban plans at least 90 days prior to the effective date of the new bans.

One concern expressed to the Department by some C&D handling facilities is that they will need some period of time, beyond that needed to submit waste ban plans, to come into compliance with the new waste bans once they become effective. One argument is that markets for all the banned materials, in particular wood, are not well established and it will take some period of time for a sufficient market to be established. Sufficient outlets for wood will be needed for separated wood. The Department will therefore consider whether a transition period following the effective date is needed for facilities to come into compliance with the new bans. Options could include:

- Allowing a transition period on a material specific basis, looking at the available markets for each material. Is a transition period needed for each of the materials proposed to be banned, or only for wood?
- Establishing a defined period (for example, one year) in the guidance document for all facilities to come into full compliance with the new waste bans.
- Providing for case-by-case review of a facility's waste ban compliance plan and proposed transition period. The facility would need to identify, in the waste ban plan, what markets exist for the materials, why they cannot meet the ban as of the effective date and how long the facility will need to come into compliance with the waste bans for each new banned material.
- Providing for case-by-case review of a facility's waste ban compliance plan. The facility would need to identify why they cannot meet the ban as of the effective date and commit to removing as much of a banned material as possible.

The regulations at 310 CMR 19.017 require solid waste handling and disposal facilities to submit waste ban compliance plans. The solid waste handling and disposal facilities include transfer stations, landfills, municipal waste combustors and construction and demolition facilities. Waste ban compliance plans should demonstrate how the facility operator will ensure that the facility will not dispose, or transfer for disposal, solid waste commingled with unacceptable quantities of restricted materials. Once a plan is approved by DEP, it must be implemented by the facility. DEP will use the plan to evaluate compliance and conduct enforcement (if needed). DEP is considering exempting municipal waste combustion facilities from the ban on wood in light of the fact that chipped wood currently is sent to out-of-state wood-fired boilers and is an acceptable fuel.

The Department is also asking for comment on a possible future ban on wallboard. Wallboard consists largely of gypsum. When wallboard is processed through C&D processing facilities, the wallboard is crushed or shredded and the gypsum becomes one of the fractions that ends up in what is known as C&D fines. C&D fines material is approved for beneficial use as an alternative daily cover material at landfills or as grading and shaping material in closure of old landfills. Recently some of the landfills that have used C&D fines for daily cover or grading and shaping

material have developed nuisance odors that the Department believes is primarily hydrogen sulfide gas (H₂S.) The Department believes that H₂S results from the gypsum in wallboard, which contains sulfur.

DEP is particularly interested in receiving comments on:

- 1. Whether the Department should exempt municipal waste combustion facilities from the ban on C&D wood.***
- 2. What the effective date for the new banned materials should be. The current proposed date is 9 months after the effective date of the revisions to the regulations.***
- 3. Whether a transition period should be established for solid waste handling facilities to come into compliance with the ban on disposal or transfer for disposal of asphalt pavement, brick, concrete, metal and wood and if so, how long should the transition period be. What type of transition period would be favored?***
- 4. Are there any reasons why DEP should not proceed with development of a waste disposal ban for gypsum board that would require that gypsum board be either source separated at the point of generation or separated from the waste stream by C&D processors so that the gypsum is not introduced into C&D fines or grading and shaping material. (Please note that there is no disposal ban on gypsum board proposed at this time.)***

C&D Debris Generation and Market Conditions

In 2000, approximately 4.5 million tons of C&D debris were generated in Massachusetts, making it the single largest category of non-MSW material. Approximately 78% was recycled or reused in some beneficial manner with the remainder being disposed almost exclusively in landfills.

C&D can be divided into three distinct types: road and bridge construction materials, building demolition materials, and new building construction materials. There is already an infrastructure in place for recycling road and bridge material (i.e., asphalt pavement, brick, concrete and metals), and these materials are routinely diverted from building demolition and construction waste. The infrastructure for management of building demolition and new building construction wastes is being further developed in anticipation of the proposed Waste Bans. In Massachusetts, over the past 2-3 years new C&D processing capacity has come on line and more is in the planning stage to meet the demand for C&D processing. The Department, contingent upon funding, is encouraging the establishment of C&D recycling industries by providing grants up to \$150,000 each to C&D recycling companies who purchase recycling equipment through the Recycling Industry Reimbursement Credit (RIRC) program. In addition, the Recycling Loan Fund provides low interest loans up to \$500,000 for C&D recyclers.

Most wood from construction and demolition debris activities is currently used as boiler fuel, as a component of alternative daily cover at landfills, as a component of shaping and grading material at landfills, or disposed in landfills. The C&D Subcommittee members have discussed their intent to proactively explore other outlets for C&D wood including diverting material to building material re-use stores, planing wood for use as dimensional lumber, separating clean wood from the mixed C&D waste stream for use as mulch or animal bedding, and using C&D wood for energy recovery in support of the Division of Energy Resources' Renewable Energy Portfolio Standards.

C&D Subcommittee

In April 2001, DEP convened a C&D subcommittee of the Solid Waste Advisory Committee (SWAC) to provide input to the DEP's programs and policy discussions related to the proposed ban on disposal of unprocessed C&D debris. These stakeholders include architects/engineers, building owners, contractors, waste haulers, C&D processors, landfill owners, environmental groups, trade associations, law firms and consultants.

Recommended Options and Rationale

Based on the input of the C&D Subcommittee, rather than ban "unprocessed C&D waste" as proposed in the SWMP, the recommended approach to banning disposal of unprocessed C&D debris is as follows:

- Add asphalt pavement, brick, concrete, metal and wood to the list of materials banned in 310 CMR 19.017 effective December 31, 2003. (Please note that although this was the recommendation of the C&D subcommittee, the effective date of the bans will be later and is proposed in this draft regulation to be 9 months after the date of promulgation of the regulation.)
- Require C&D processing and disposal facilities to comply with existing ban on cardboard effective December 31, 2003.
- In accordance with the SWMP, DEP should proceed to add other components of C&D waste and food waste to the list of banned materials at later dates.

This approach of banning specific materials addresses the largest components of the C&D waste stream and strikes a balance between sending strong market signals and being realistic given the current infrastructure for diverting C&D materials from disposal in Massachusetts.

Definitions

Definitions of each of banned materials currently exists in the document Guidance for Solid Waste Handling and Disposal Facilities on Compliance with DEP's Waste Control Restrictions. In general, the definitions in the Guidance are narrower than definitions in the regulation. For example, while the regulation bans metal containers, the Guidance indicates that the only metal containers that need to be addressed by a facility's waste ban plan are beverage and food containers.

The definitions to be added to the regulations include definitions for materials proposed to be added to the list of banned items. In addition, the definition of White Goods is proposed to be modified.

Asphalt Pavement, Brick, and Concrete means asphalt pavement, brick and concrete from construction activities and demolition of buildings, roads and bridges and similar sources.

Metal means ferrous and non-ferrous metals derived from used appliances, building materials, industrial equipment, transportation vehicles, and manufacturing processes.

White Goods means appliances employing electricity, oil, natural gas or liquefied petroleum gas to preserve or cook food; wash or dry clothing, cooking or kitchen utensils or related items; or cool or heat air or water.

Wood means treated and untreated wood but does not include wood waste.

C&D Waste Ban Guidance

The C&D Subcommittee has also provided input to the Department on amending the existing Guidance for Solid Waste Handling and Disposal Facilities on Compliance with DEP's Waste Control Restrictions to incorporate information on the proposed new waste bans on asphalt pavement, brick, concrete, metal and wood and provide guidance to facilities on compliance with those new waste bans. The document provides compliance assistance regarding acceptable de minimis quantities of restricted materials in the solid waste stream as well as guidance on how solid waste facilities can inspect for and handle restricted materials. For example, the document clarifies that facilities that receive small loads of restricted C&D debris, generally from households only (less than 5 cubic yard deliveries), do not have to conduct comprehensive load inspections. Furthermore, the guidance document has been amended to address the number of inspections a facility should complete to ensure that there are no restricted materials in the waste above de minimis quantities. For example, a facility does not need to open and inspect bags if they opt to double the number of inspections.

A draft of the Guidance for Solid Waste Handling and Disposal Facilities on Compliance with DEP's Waste Ban Restrictions can be obtained on the Department's website at:

<http://www.mass.gov/dep/bwp/dswm/dswmpubs.htm> - regs

for review and comment.

Waste Bans and the Commerce Clause

DEP drafted the ban proposed in the draft regulations and the waste ban guidance described above so that it would not conflict with the Commerce Clause. In drafting the ban and guidance, DEP evaluated its options under various commerce clause tests. The more stringent test for Commerce Clause violations applies to laws that discriminate against interstate commerce "on their face" or by their plain effect. See, Philadelphia v. New Jersey, 437 U.S. 617, 627 (1978) (New Jersey law banning importation of waste found to be discriminatory on its face or by its plain effect and therefore not subject to balancing test). DEP believes the waste ban regulations do not on their face discriminate against interstate commerce because the waste bans apply equally to all C&D waste generated in Massachusetts and allow waste to flow to any facility that has an approved waste ban plan.

The less stringent test for Commerce Clause involves a balancing of state interests and the effect on interstate commerce. See, Pike v. Church, 397 U.S. 137,142 (1970) (Arizona fruit packing requirement violates Commerce Clause because the local purpose of promoting Arizona grown crops with stringent packing requirements is clearly excessive in relation to the burden on interstate commerce). The Pike v. Church case established that laws may discriminate against interstate commerce by their effect if the local benefits or interests outweigh the burden on

interstate commerce and less restrictive alternatives do not adequately protect the local interest. Pike v. Church, 397 U.S. 142.

Under the Pike v. Church analysis, DEP believes its waste bans do not discriminate against interstate commerce. DEP finds that Massachusetts has a strong interest in preserving landfill space for non-recyclable materials. Landfills take up valuable acreage, create an environmental risk, and are costly to build and operate. Therefore, Massachusetts has an interest in promoting the recycling of materials that have other uses such as the proposed banned materials. Furthermore, DEP finds that alternatives to replace a ban would not reach Massachusetts' goal of reducing disposal of recyclable materials and that the burden on interstate commerce from the ban is minimal. Separated materials may flow freely across the state lines. Un-separated waste may flow across state lines so long as the materials are separated at the destination or not disposed. In this way, DEP furthers its goal of encourage recycling and conserving disposal facilities for materials that may not be recycled. Under the Pike v. Church test, DEP believes that Massachusetts' interests outweigh the small burden on interstate commerce and that such interests could not be promoted through activities with a lesser impact on interstate commerce.

3. Permitting requirements (19.020 – 19.038)

Permit Requirements for Solid Waste Management (19.020)

Add Paragraph (4) from section 19.021 as described below.

Transition Requirements for Existing Facilities (19.021)

It is proposed to modify this section by moving paragraph (4), entitled Inactive Landfill Facility Filing, from section 19.021 to 19.020 and deleting the remainder of section 19.021. 19.021 includes a number of transition permitting requirements that were directed to landfills operating at the time the Solid Waste regulations were promulgated in 1990. These transition requirements are no longer relevant to the landfills that still operate. The section that is being retained and moved to 19.020 is for landfills that were no longer in operation in 1990. These requirements remain valid today since there are old landfills that have never been properly closed and capped. When such a facility comes to the Department for some reason such as a proposal to develop the site for a post-closure use, the Department needs to refer to this regulation when discussing what actions must be taken to bring the site into compliance with the solid waste regulations.

Accelerated Closure Schedules (19.022)

This section is no longer applicable and will be deleted since unlined municipal landfills have all been closed pursuant to the "Hynes Amendment."

Permit by Rule for Certain Existing Transfer Stations (19.023)

It is proposed to delete this section in its entirety. These transition requirements are no longer necessary. All transfer stations that are still in operation should have already complied with these requirements and been re-permitted. If a transfer station has not done so, then the facility is subject to enforcement action by the Department.

Application requirements (19.030)

Several minor modifications are proposed for this section of the regulations.

Two paragraphs that contain application requirements for landfills and handling facilities that were in existence prior to the 1990 effective date of the regulations are no longer needed and are therefore proposed for deletion. All existing facilities to which these paragraphs refer should have already filed the required applications or registrations. Any facilities that may not have filed an application as required is subject to enforcement action.

Procedure for Review of Applications for New Facilities or Major Expansions (19.032)

Several minor modifications are proposed for clarification and to make changes consistent with the deletions made to the old transition requirements.

Public Notice for Facility Permit Actions (19.033)¹

Two modifications are proposed. The first is to establish a clear date for the beginning of the comment period. The regulations currently do not establish a date certain for the start of the comment period. That date is now proposed to be the date the public notice is first published in a newspaper.

The second revision is to add to the list of those receiving notice “abutting boards of health” or those boards of health in adjacent municipalities where the municipality is within one-half mile of the proposed facility. This change brings the Solid Waste Regulations into line with public notice requirements already contained in the Site Assignment Regulations, 310 CMR 16.00.

Applicability and review criteria for permits (19.038)

The applicability and review criteria for permits have been completely re-written to simplify the requirements and clarify which criteria apply to different types of activities. In addition, the risk evaluation criterion that was added to the Site Assignment Regulations has been added to the permitting criteria.

When the recent revisions to the Site Assignment Regulations, 310 CMR 16.00, were made available for public comment there were numerous comments that the Department should not incorporate the new siting setbacks into the permitting criteria at 310 CMR 19.038 in such a way that the new setbacks would apply to facilities which had obtained a site assignment under the setbacks established in the 1988 Site Assignment Regulations and were now coming to DEP for an authorization to construct (ATC) the next phase of the previously approved landfill. Facility operators felt this would be unfair in light of the fact that their facilities had gone through the appropriate site assignment review in place at the time and received a site assignment. They further maintained that the business plans for such facilities were based on their site assigned area and to now require more stringent setbacks for the next phase of construction would be unfair and an economic burden.

¹ In addition to the public participation requirements established in these regulations, facilities may need to address enhanced public participation efforts where the project is located near a community identified as an Environmental Justice (EJ) community pursuant to the “Environmental Justice Policy of the Executive Office of Environmental Affairs”. This policy is available on the internet at: <http://www.state.ma.us/envir/ej/default.htm>.

In response to those concerns, the proposed regulations make clear that the less stringent setbacks in the Permitting Criteria at 310 CMR 19.038 apply to those facilities site assigned or that had submitted an administratively complete application prior to the adoption of more stringent setbacks in the Site Assignment Regulations in June, 2001. Otherwise, the new setbacks in 310 CMR 16.00 apply through the site assignment process.

In addressing the above concerns, DEP realized that there are several criteria that are not setbacks and which DEP believes must be applied during permitting to all facilities or all landfills. For example, the criteria addressing seismic areas and fault zones are required by the Federal Subtitle D regulations. Therefore, some criteria have been moved to the general criteria section and several specifically related to landfills (seismic area, location near faults, etc.) have been moved to a new section entitled Additional Landfill Criteria.

Related to the siting criteria and permitting criteria, the Department is currently planning to begin review of the goals established in the Beyond 2000 Solid Waste Master Plan in 2004. The 2000 plan committed DEP at that time to revising the site assignment regulations to make several siting criteria more stringent, as well as modifying these regulations to add the double liner requirement, which is discussed elsewhere in this document. The modifications to the Site Assignment Regulations were published on June 8, 2001. Over the years it has become clear that siting new capacity for the management of solid waste, whether landfills, transfer stations or C&D processing facilities, is extraordinarily difficult in Massachusetts. At the same time, Massachusetts is very short of having sufficient disposal capacity to manage the waste we generate. Therefore, in reviewing the goals for establishing new capacity that were outlined in the Master Plan, the Department believes that the siting and permitting criteria that apply to siting new capacity should also be reviewed to determine what impact they may have on siting.

DEP is particularly interested in receiving comments on:

- 1. Whether the recently promulgated setbacks contained in the Site Assignment Regulations at 310 CMR 16.40 have an impact on the siting of new disposal capacity in Massachusetts.***
- 2. Whether the permitting criteria contained in the Solid Waste Facility Regulations at 310 CMR 19.038 have an impact on the siting of new disposal capacity in Massachusetts.***

4. Beneficial Use Determinations (19.060)

Introduction

In May 1990, the Department promulgated the beneficial use determination (BUD) regulations to allow the beneficial use of materials that would otherwise be discarded. Prior to promulgation of these regulations, discarded materials were considered solid waste regardless of their beneficial use potential. The BUD regulations allowed the Department to re-classify discarded materials that were traditionally viewed as waste to avoid conflict in the regulations that would have required a solid waste site assignment at beneficial use locations.

At the time, materials envisioned for beneficial use were easily characterized, meaning that the Department was aware of the constituents of concern and could readily evaluate the potential

environmental or human health impacts. Since then, the number of BUD proposals has increased due to shrinking landfill capacity, increased disposal costs, and a growing recycling industry. These factors have compelled waste generators to aggressively pursue alternative management options for various large volume solid wastes that may or may not contain toxic constituents (contaminants of concern). Consequently, the Department continues to receive an increasing number of beneficial use proposals for materials that contain toxics, are complex in chemical composition and whose proposed uses require careful consideration of possible environmental and human health impacts.

Existing Regulatory Shortcomings

Because the May 1990 BUD regulations were intended to address a small universe of easily characterized materials, the regulations contain broad application requirements and general standards for approval. As the number of beneficial use materials containing toxics has increased, the lack of specific application requirements pertaining to waste characterization, risk assessment and other factors has slowed the application and review process. Each application requires development of new application requirements and a case-by-case evaluation of the potential risks. This approach is time consuming and resource intensive due to the variability of discarded materials and the diversity of intended uses.

The Proposed Revisions

The BUD regulations and requirements are being revised to clarify waste characterization, risk assessment and other permit evaluation criteria. To streamline and simplify the process, requirements are tailored to the types of uses proposed, taking into consideration their potential for human exposures and environmental releases. The evaluation requirements for BUDs address potential risks to the environment and public health from potentially toxic or otherwise hazardous components of the waste materials with the goal of preventing such components from being released into the environment in an uncontrolled fashion. Hazardous or toxic components of the waste materials are termed Contaminants of Concern (COCs). Critical Contaminants of Concern (CCCs) are a subset of COCs, whose properties, including toxicity, persistence in the environment, ability to bioaccumulate, frequency of occurrence and concentrations in the environment make them a special threat to the environment and public health.

In order to ensure that reuse does not damage the environment or threaten public health, all BUD approvals will require that the applicant adequately demonstrate that the proposed reuse meets the following criteria (henceforth referred to as the Reuse Criteria):

- 1) no significant risk to public health will be created; and,
- 2) no significant adverse environmental impacts will be created; and,
- 3) reuse will not result in increases in the environmental concentrations of any critical contaminants of concern (CCCs), including PBT chemicals and other priority chemical pollutants as may be identified DEP; and,
- 4) reuse must be in compliance with all applicable standards and guidelines as specified by DEP.

The approach of the Beneficial Use Regulation revisions is to categorize intended uses in light of their potential for environmental releases of chemicals of concern or to create potentially hazardous exposures to people, in order to quickly narrow the application requirements and

establish defined assessment requirements for each. Application requirements and standards for reuse are broken down into four distinct Reuse Categories. These categories are used to delineate a scope of work appropriate to each application in order to demonstrate that the Reuse Criteria are met- (i.e., more comprehensive waste characterization and risk assessment is required for applications that involve greater potential for environmental release or exposure).

The Reuse Categories include:

- 1) Use of Secondary Materials in Commercial Applications;
- 2) Use of Secondary Materials in Regulated Systems;
- 3) Use of Secondary Materials in Restricted Applications; and,
- 4) Use of Secondary Materials in Unrestricted Applications.

These regulations will not apply to recycling activities that are otherwise allowed without a Beneficial Use Determination.

Through these proposed regulations the Department has the goal of encouraging beneficial uses of secondary materials, but not at the expense of environmental quality. These regulations try to strike the right balance between beneficial use and environmental protection without being overly stringent. Toward that end, the Department has chosen to make the BUD regulations more stringent than the Massachusetts Contingency Plan regulations for cleanup of sites with oil and hazardous materials. In part, this is because the BUD regulations will result in use of secondary materials with some level of contamination being used in clean environments, whereas the MCP regulations are used for cleanup of already contaminated sites. It is important that by allowing the beneficial use of secondary materials the Department not create new sites to which the MCP would apply.

The Department is particularly interested in receiving comments on the following issues:

- ***Has the Department struck the right balance between encouraging beneficial use and ensuring protection of public health, safety and the environment?***
- ***The draft BUD regulations propose using as standards an excess lifetime cancer risk of less than five-in-one million and a non-cancer cumulative hazard index of less than 0.5. These proposed standards are more stringent than the standards used in the Massachusetts Contingency Plan Regulations for cleanup of hazardous materials. Are these standards reasonable for BUDs where a secondary material is being placed in or on the ground as opposed to cleaning up a contaminated site?***
- ***When sampling secondary materials, such as concrete painted with lead paint, should the total mass of the secondary material (the paint plus the concrete) be sampled to determine the concentration of contaminants, or should the individual components be sampled separately where one component is not part of the matrix of the underlying material. Sampling of the total mass of a secondary material will result in dilution of the contaminants that may be in the paint, whereas sampling the components separately will allow consideration of how to manage each of the separate components.***
- ***The draft regulations propose using the same Upper Concentration Limits (UCLs) as are in the MCP to establish an upper limit on the use of a secondary material that may contain a contaminant, where the material may be placed in or on the ground, regardless of the controls implemented to prevent exposure. Should the Department***

establish such an upper limit to control the amount of a contaminant that could be used? Are UCLs the right tool to limit the concentration of contaminants in a secondary material?

- *One of the standards for Reuse of secondary materials is that the reuse may not result in increases in the environmental concentrations of any critical contaminants of concern (CCCs), i.e. the concentration of a CCC in a secondary material may not exceed the background concentration of that CCC. Is this standard a reasonable standard to use in determining whether a secondary material may be used?*
- *The BUD regulations will determine background based on the 50th percentile of a valid data set, whereas the MCP uses the 90th percentile of a valid data set. This approach is more stringent than that in the MCP. The MCP allows for more variability in determining background. Should the BUD regulations rely on the use of a more stringent determination of background?*

Regulation Development

To establish a framework for these regulations, the Department's Bureau of Waste Prevention worked with an advisory committee that was comprised of representatives from the following groups: the recycling industry, environmental consultants, environmental interest organizations, waste generators, waste users, and educational institutions. Regular meetings were scheduled to discuss how the regulations could be clearly written so that they would be protective to people and the environment, as well as promote beneficial use. DEP has created a draft guidance document with the intent to assist applicants with the assessment methods and risk management criteria to be applied for the reuse categories. The draft guidance is available on DEP's website for review and comment at:

<http://www.mass.gov/dep/bwp/dswm/dswmpubs.htm> - regs

It is the goal of the Department to have the final BUD guidance available when the final regulations are published.

Reuse Criteria

The Reuse Criteria are intended to identify levels of constituents, which, if exceeded, may create a significant risk or adverse impact to people or the environment or lead to unacceptable increases in environmental levels of CCCs. They are designed to be protective of public health, welfare, and the environment. The Beneficial Use Regulations offer several methods for demonstrating that the Reuse Criteria are met. The level of characterization and assessment is based upon the Reuse Categories, which exhibit differing potential for environmental releases and exposures. In all cases, waste materials containing CCCs must demonstrate that significant releases of these contaminants will not occur over the lifecycle of the reuse. All methods are designed to provide for an adequate demonstration that the Reuse Criteria are met and to provide flexibility to the applicant in preparing an application.

Beneficial Use Categories

1) Use of Secondary Materials in Commercial Products. The Department considers products that are manufactured from secondary materials to be commercial products when the material is *controlled and appropriately managed throughout its lifecycle* in a manner that poses no

significant risk considering human exposures and environmental releases of contaminants of concern (COCs). The waste constituents of the product must also not significantly differ in composition from “traditional” materials safely used in existing products. For such products, compliance with the BUD Reuse Criteria can be demonstrated using a comparative analysis of the beneficial reuse material versus the traditional material(s) it is replacing. This analysis must reasonably demonstrate that 1) levels of COCs in the waste material, 2) potential human exposures to these COCs, and 3) potential releases of COCs from this material to the environment are comparable to those of the traditional product (henceforth referred to as the Comparable Use Criteria). If these criteria are met, a further risk assessment would not be required.

Example - Since asphalt roofing shingles contain the same basic ingredients as asphalt pavement and since use of asphalt shingles in this application would not be expected to significantly change the chemical properties of the asphalt pavement (and thus potentially increase releases of and exposures to COCs), replacing virgin asphalt with post-consumer asphalt from shingles in asphalt road construction would be considered a Commercial Product use and would generally be allowable. In this case the evaluation could be made based upon a comparative analysis of the chemical composition of shingles versus the asphalt and a brief market analysis addressing overall use of the material.

Beneficial reuse of materials that may reasonably be anticipated to increase risks or environmental releases of COCs above those of the traditional product in the same application are not considered Commercial Product uses.

Beneficial Use Classification

Applicability Criteria

The permit application requirements, level of review, and standards for approval are comensurate with risk.

	Category I	Category II	Category III	Category IV
USE	Use of Secondary Materials in Commercial Products	Use of Secondary Materials in Regulated Systems	Use of Secondary Materials in Restricted Applications	Uncontrolled Use of Secondary Materials in Unrestricted Applications
CRITERIA	the final product conforms to specifications, as applicable and risk from the final product is similar to products produced from virgin feed stock and pose no significant risk (NSR)	the use is partially adequately regulated by existing regulations or policies. The BUD regulates aspects of the use that are not adequately regulated and the use poses NSR	secondary material is recoverable and exposure pathways are restricted and the use poses NSR	material use is integral to soil or unrestricted exposure pathways to hazardous materials but risk assessment demonstrates NSR

2) Use of Secondary Materials in Regulated Systems. When a use of a secondary material is in an application that is governed by other Departmental policies or regulations for reasons other than beneficial use, the Department considers aspects of the reuse covered by these policies or regulations to be adequately regulated provided the activity is in compliance with any applicable policies or regulations, and the terms and conditions of any permit, order or approval.

Example - If an applicant were to propose manufacturing industrial biomass from demolition wood, the air quality component of the application would be evaluated through the air quality permit. The solid waste review would focus on non-air quality impacts, such as nuisance conditions, management of the resulting ash, leaching of stockpiles, multimedia impacts potentially associated with material processing or reuse and/or other impacts associated with final material reuse. Compliance with the Reuse Criteria would still be required. Activities such as storage and speculative accumulation of waste material, which may not be adequately regulated, will require authorization by means of the BUD.

3) Use of Secondary Materials in Restricted Applications. The Department categorizes a material that is not used in either commercial products or regulated systems as a ***restricted use*** if there are controls (engineering, location, best management practice requirements, deed restrictions, etc.) placed on the use of the material that adequately limit potential environmental releases and exposures of people and environmental receptors to COCs.

Approval of a Restricted Beneficial Use Application will rely on creating permit conditions sufficient to ensure that the Reuse Criteria are met. These could include, for example, a combination of engineering controls, best management practices, notification of property owners, tracking of secondary materials when necessary, etc., that control or prevent environmental releases of, and human exposures to, toxics in the waste. The Reuse Criteria may be met by demonstrating that exposure and release pathways do not exist using a BUD Method 1, 2 or 3 Risk Assessment (described below) utilizing exposure assumptions appropriate to the reuse (see below) and appropriate controls. To ensure that these controls remain in place, the Department will impose appropriate permit conditions.

Example - Use of a waste material as fill at a specific site with use restrictions would fall into this category. Compliance with the Reuse Criteria would be met, for example, by demonstrating that exposure and release pathways do not exist, or in cases where they do, by comparison to BUD Method 1 reuse standards (described below), or use of a BUD Method 3 risk assessment (described below) with identification of appropriate exposure pathways. Permit requirements would be established to ensure that exposure and release pathways are adequately controlled.

The Reuse Criteria may also be met by demonstrating the concentrations of all hazardous materials are at or below the 25th percentile of a statistically valid and appropriate background concentration sample data set of Massachusetts's soils. Under the MCP, the 90th percentile of an applicable distribution of contaminant concentrations in "clean" soils was used to establish generic background values for metals (<http://www.state.ma.us/dep/ors/files/backtu.pdf>). These values are used in the MCP to evaluate consistency of site contamination with background. Under the BUD process, consistency with background requires demonstration that secondary

material constituent concentrations are at or below the 50th percentile of an appropriate background soil concentration data set. Such data must be derived from samples of clean soils (rural, uncontaminated soils). The MCP background values for PAHs were based on fill materials that are expected to have somewhat elevated levels compared to undisturbed soils. For these chemicals, the BUD Method 1 standards rely on the 25th percentile of the distribution for statewide uses and the 50th percentile of the distribution when site-specific values are calculated.

3) Use of Secondary Materials in Unrestricted Applications. These are cases where there are few, if any, limitations as to where and how the material may be used. These categories employ the same Reuse Criteria, but differ in the levels of evaluation required. Because use is unrestricted and potential exposure and release pathways cannot be effectively controlled in this situation, demonstration of compliance with the Reuse Criteria requires a more comprehensive assessment of human health risk, ecological risk and other impacts. Demonstrating that Unrestricted BUD applications meet the Reuse Criteria will thus require extensive chemical characterization, human health and ecological risk assessment and assessment of background environmental levels as appropriate.

To demonstrate whether the Reuse Criteria are met for unrestricted use applications, human and ecological risks must be assessed. For critical contaminants of concern, background environmental concentrations must also be assessed. To demonstrate that the Reuse Criteria are met, concentrations of COCs must not exceed acceptable risk levels for human and ecological receptors and comply with all appropriate standards and guidelines (see Risk Assessment section below). CCC concentrations must also be shown to be below background levels (see Background Concentration Assessment below).

Example - Reuse of any waste material containing COCs as compost for generic applications, as fill, as a soil amendment etc., would fall into this category. If, through a comprehensive chemical characterization, background environmental concentration assessment and risk assessment, (see below) the applicant demonstrates that the material reuse meets the Reuse Criteria noted above, an unrestricted BUD permit may be issued. If, on the other hand, these evaluations determine that any of the criteria are not met then unrestricted use of the material would be denied. Other restricted uses might, however, be permissible.

Risk Assessment Process Applicable To Bud Evaluations

The Risk Assessment Process includes four steps: Hazard Identification; Exposure Assessment; Dose Response Assessment; and Risk Characterization. Risk assessments help to inform management decisions that may be based on acceptable risk levels as well as other factors. The Risk Assessment Steps as they relate to BUD evaluations are briefly discussed below.

(1) Hazard Identification. Identifying potential hazards associated with the reuse of any waste requires a thorough Waste Characterization. The chemical composition of the waste material must be adequately characterized, including a comprehensive list of all potentially toxic components likely to be present based on the products contained in the waste and/or comprehensive chemical analyses. All potentially hazardous components from this list will be considered contaminants of concern (COCs). Critical contaminants of concern (CCCs), including Persistent Bioaccumulative Toxins (PBTs) as well as other chemicals that DEP may identify,

must be analyzed for. Statistically valid data on the concentration of all COC/CCCs must be provided by the applicant using appropriate sampling, analytical, quality assurance and quality control methods. (For example, note that compilation of data only from Material Safety Data Sheets (MSDS's) may be insufficient depending upon the nature of the material, potential concerns and the intended use. An inability to identify all chemical constituents in the waste - for example, due to proprietary information claims by source product manufacturers- may be grounds for denying an unrestricted use permit.)

(2) Exposure Assessment. Exposures to COCs associated with BUD materials must be assessed using methods consistent with the Massachusetts Contingency Plan (MCP) regulations, 310 CMR 40.0000. (Note, for restricted uses these should be appropriate to the proposed use situation). Because unrestricted uses could involve varied applications, conservative human and ecological exposure pathways and assumptions will be required for such applications, consistent with Method 3 of the MCP (e.g. to assess human risks, a residential exposure scenario considering both children and adults would be required). Ecological impacts would be assessed on the basis of soil, sediment and surface water guidelines and criteria.

(3) Dose Response Assessment. The toxicity of COCs must be determined using appropriate toxicity information relevant to cancer and non-cancer endpoints, as well as the ecological risk potential.

(4) Risk Characterization. Based on exposure and toxicity information, risks to people and ecological receptors must be assessed. Uncertainties should be identified and discussed. Risks must be characterized using methods consistent with those in the MCP, which provides three overall approaches that can be adapted to the evaluation of COC concentrations in waste materials. These approaches are briefly discussed below, and include:

- BUD Method 1 (comparison to applicable BUD Reuse Standards as developed by DEP);
- BUD Method 2 (comparison to analogous standards); and,
- BUD Method 3 (quantitative risk assessment).

BUD Method 1: Comparison to DEP BUD Reuse Standards. Secondary materials may be evaluated by comparison to BUD Method 1 Reuse Standards appropriate to the proposed reuse. Method 1 Reuse Standards are under development by DEP's Office of Research and Standards. Both Methods 1 and 2 can be used where secondary materials have fewer than 10 COCs.

If a secondary material contains more than 10 COCs, then use of Methods 1 and 2 may be limited. In this case, Methods 1 and 2 may only be used if the sum of the ratios of each COC compared to its applicable BUD Method 1 Standard is less than 10 (i.e., the Total Waste risk attributable to all the COCs is demonstrated to not exceed acceptable total risk levels. The actual value will depend on the acceptable risk level chosen.)

The Department will derive and publish applicable BUD Method 1 Standards for a suite of chemicals and guidance for determining Total Waste Risk. This guidance will be issued in a separate BUD Guidance Document that the Department is preparing at this time and which will be available for comment soon. Ultimately, DEP expects to derive values for most of the chemicals for which MCP Method 1 standards currently exist.

(Nonetheless, this list covers only a small fraction of the thousands of chemicals in commercial use that may contaminate various waste streams. It is the applicant's responsibility to adequately assess the risks of chemicals for which DEP has not derived BUD Method 1 values). BUD materials with any COC in exceedance of these BUD Method 1 Standards; or, which upon use lead to an exceedance of any other promulgated standard, will be ineligible for an unrestricted use permit. (Potentially applicable regulations and standards include, Massachusetts Contingency Plan Method 1 Standards promulgated at 310 CMR 40.0970, The Massachusetts Drinking Water Quality Standards promulgated at 310 CMR 22.00, Massachusetts Air Quality Standards promulgated at 310 CMR 7.00, and, Massachusetts Surface Water Quality Standards promulgated at 314 CMR 4.00).

BUD Method 2. Comparison to Suitably Analogous Standards. When an appropriate DEP derived BUD Method 1 standard is not available for any COC in the waste, the applicant may propose a standard based on protocols consistent with the DEP methods used in the derivation of the existing BUD Method 1 standards.

BUD Method 3. Quantitative Risk Assessment. The proponent must use this approach if the sum of the ratios of each COC compared to its applicable BUD Method 1 Standard exceeds 10 (value will depend on acceptable risk level). The proponent may choose this approach to evaluate risks associated with restricted reuse applications to account for specific reuse scenarios where exposure pathways differ from those used in the derivation of the Method 1 and 2 standards. Note, that use of Method 3 cannot be "mixed" with the other Methods. Unrestricted Reuse would not be allowed if any COC exceeds an applicable BUD Method 1 standard. A Method 3 assessment must be completed in a manner consistent with scientifically acceptable risk assessment practices and guidance published by the Department. The Applicant uses the Risk Assessment to calculate Total Waste Reuse Cancer and Non-cancer Risks as well as potential impacts to ecological receptors. In order to use the material in the proposed application, the calculated values may not exceed:

- 1) A Total Waste Cancer Risk Limit equal to (an acceptable risk value to be determined - perhaps MCP value divided by additional uncertainty factor- would fall in range of $10e-5$ and $10e-6$);
- 2) A Total Waste Non-cancer Risk value, as determined through the derivation of a Cumulative Hazard Index, of (an acceptable risk value to be determined; as above- would fall in range of 0.2-1); and
- 3) Applicable ambient water criteria or other ecological impact criteria, as appropriate.

Background Environmental Concentration Assessment

The impacts of use of the material on levels of CCCs in the environment must also be assessed. CCC concentrations in reuse materials must be demonstrated to be below background levels already in the MA environment as determined by statistically valid sampling, using the median value based on representative, non-impacted, background soils in and contingent to the area of use. The applicant must also demonstrate that the BUD reuse will not lead to long-term build up of any CCC, lead to adverse impacts attributable to concentration in the food-chain or exceed

any additional criteria that the Department may establish to ensure the protection of public health and the environment.

5. Demonstration Projects or Facilities (19.062)

One of the Department's review criteria for determining whether to grant a demonstration project permit needs to be clarified. The review criterion in question is whether the facility "has a valid site assignment, if applicable." Proponents of demonstration projects have often taken that criterion to mean that they should argue that their demonstration project or facility does not need to obtain a site assignment, even though the type of facility in question requires site assignment under normal circumstances. Therefore, to clarify this criterion the Department is proposing to modify it to refer specifically to the applicability section of the Site Assignment Regulations, 310 CMR 16.00, which determines which facilities are required to obtain site assignment and which are exempt. The intent of this criterion was to ensure that those projects or facilities that need a site assignment under the site assignment regulations will have one. Therefore, if a proponent is proposing an innovative type of waste handling facility, it will need a site assignment, whereas if a proponent is proposing an innovative recycling facility, provided it meets the criteria for exemption under the Site Assignment Regulations, it will not need a site assignment.

6. Ground Water Protection Systems (19.110)

Introduction

In the 2000 Solid Waste Master Plan (SWMP) the Department detailed a number of initiatives that would require changes to 310 CMR 19.000, the Solid Waste Management Facility Regulations. One of those proposed provisions was to change the existing minimum regulatory requirement for groundwater protection systems, or liners, from the current composite liner requirement (24 inches of 10-7 cm/sec low permeability soil plus a flexible membrane liner (FML)) to a double liner standard. Because the existing regulations were established as **minimum** design and performance standards, the SWMP also indicated that DEP would require double liners to be constructed for new phases of landfills upon issuance of the Master Plan until new regulations could be promulgated. Double liners had already been required in certain cases where a landfill was located in a more sensitive area. The Department, working with a double liner subcommittee of the Solid Waste Advisory Committee, then developed an interim policy to establish a double liner design until the regulations are revised (see discussion below). The double liner design presented in the draft regulations is based upon the design established in the Interim Policy.

Foremost among revisions to the liner standards is the requirement for all new phases of landfills to be constructed with more protective liner systems that will allow early detection of leakage problems before leakage escapes the landfill and enters the groundwater beneath the site. Early detection of leakage through a liner will make it possible for the facility operator to assess the problem and to correct it. A double liner system is constructed with a separate leak detection and collection system that allows for detection and collection of leachate that may leak through the primary liner. With the current single composite liner requirements, leakage of leachate through the liner will not be collected and will only be detected by the facility's groundwater monitoring system. At that point the leachate that has leaked from the landfill is already in the groundwater and the only recourse is to close and cap that area of the landfill if the leak is significant. The

draft regulations establish an Action Leakage Rate (ALR), or quantity of leakage per month through the primary liner, beyond which the need to assess and correct the problem is triggered. Where the amount of leakage exceeds the ALR, the Department will require the operator of the landfill to assess and correct the source of the problem. But with a double liner system this leachate is being collected.

Compared to the existing single composite liner design standard, the double liner requirement adds a highly significant monitoring and secondary collection component to a landfill liner system. Coupled with the Department's siting regulations, protection of ground and surface water resources from landfills is greatly enhanced and leakage through the primary liner can be detected much earlier, be collected by the secondary leachate collection system, and the problem assessed and repaired in a timely manner. This additional protection not only affords better protection of ground and surface water resources, but also the remaining capacity of the landfill. Because a problem with the primary liner can potentially be detected and repaired, the landfill can likely continue to operate once repairs are made, ensuring that the remaining capacity in the landfill will be usable, as opposed to being simply closed and capped early, with a resulting loss of the capacity. Coupled with the recently enacted modifications to the Site Assignment regulations, which increased the setbacks of landfills from sensitive receptors, the Department believes that the revised regulations are far more protective of public health, safety and the environment. The Site Assignment Regulations do not allow the siting of landfills in the most sensitive areas and the Solid Waste Management Regulations will ensure that those landfills that are sited have highly protective liner systems in place.

Definitions

Several new or revised definitions are proposed for addition to the regulations that define various components and materials used in double liner systems. They are presented here to assist reviewers with the discussion that follows.

Action Leakage Rate (ALR) means the quantity of liquid collected from a leak detection system of a double liner system over a specified period of time which, when exceeded, requires certain actions to be taken as described in a plan approved by the Department.

Composite Liner means a groundwater protection system that is composed of two (2) or more low permeability layers where, typically, the upper layer consists of a FML (flexible membrane liner) or Geomembrane in direct contact with the lower layer consisting of a low permeability soil and/or a geosynthetic clay liner (GCL).

Double Liner means a groundwater protection system that is comprised of two (2) liners that are separated by a drainage layer that provides a leak detection function by collecting any leachate that leaks through the primary liner.

Factor of Safety means the ratio of the breaking stress of a structure to the estimated maximum stress in ordinary use.

Flexible Membrane Liner (FML) or Geomembrane Liner means a continuous layer of low-permeability flexible polymeric material beneath, on the sides and/or on the top of a landfill or landfill cell.

Geonet means a synthetic material with its primary function designed to facilitate drainage.

Geosynthetic Clay Liner (GCL) means a liner material that is comprised of a layer of sodium bentonite clay (or similar low permeability clay) either sandwiched and mechanically secured between two materials (typically synthetic) or chemically bonded to a synthetic material to create a continuous low permeability layer or liner.

Geotextile means a permeable synthetic material that can be a woven, non-woven, composite, or knitted product that fulfills several functions in civil engineering, especially separation, filtration, drainage and protection.

Primary Composite Liner means a composite liner that is the uppermost liner in a double liner system.

Secondary Composite Liner means a composite liner that is the lowest liner in a double liner system.

Discussion

Compared to composite liners, double liner systems provide the important function of being able to monitor the performance of the primary or uppermost liner by collecting and conveying to a point outside the landfill proper any leachate that may leak through the primary liner. This provides two important environmental protection functions. First, the quantity of leachate collected in the leak detection system provides valuable information on how well the primary liner is working and whether remedial actions are needed to stop or reduce the leak. Second, because of the presence of the secondary, or lowermost liner, leachate will be contained and collected to prevent it from exiting the landfill and polluting the groundwater.

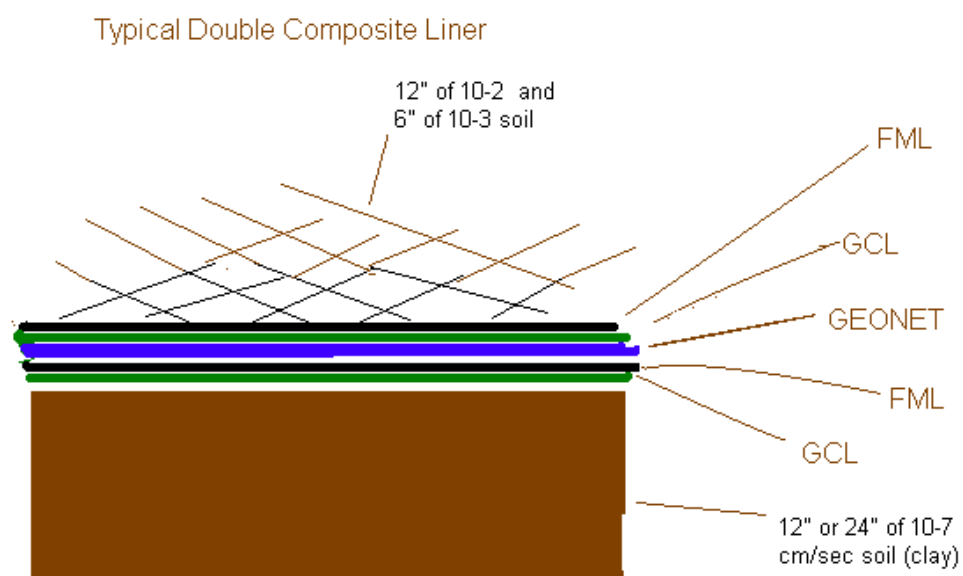
There are two (2) basic approaches that were considered in developing the double liner standard. The first approach was to add a leak detection layer and an additional low permeability layer to the existing regulatory requirement for a composite liner. This is based on the concept that certain existing design components used in single liner systems should be carried over to the new double liner design because the Department has confidence in those components and wants them to continue to be part of the future groundwater protection system design. This approach looks at performance of individual liners as separate units.

The second approach was to evaluate the double liner system based on setting performance standards established to meet the goals of a double liner system. Components of previous designs do not necessarily get carried over to the new design. This approach evaluates the overall performance of the combined liners as a functioning and integrated system, not as two separate liner units.

In the interest of gaining input to assist the Department in developing the new double liner standards, the Department conducted a number of advisory committee meetings with representatives of the landfill industry, engineers and consultants experienced in solid waste landfill design, between September 2001 and November 2001. During those meetings, the collective knowledge and experience of the group was shared and evaluated. The regulatory

requirements of other states that have a double liner standard were reviewed. Research and technical publications that evaluated the performance of double liners operating in the United States were also reviewed.

As a result of those meetings and the pressing need for guidance, the Department's interim position on double liners was issued in the document titled "Interim Guidance on Double Liner Requirements for all Landfill Authorizations to Construct (ATC) Issued After December 20, 2000", dated March 7, 2001 (a copy of that guidance can be found on DEP's web site). That guidance forms the basis for these proposed regulations. The double liner requirement supported by the Department, as found in both the Interim Guidance and the proposed regulations, is a double composite liner. The requirements of a double composite liner are outlined in Table 1. The Department believes that this design combines effective protection of public health and the environment at reasonable cost.



The majority recommendation of the liner advisory committee was different than the requirements described in the interim guidance and in these proposed regulations. The two major differences between the double liner design in the proposed regulations and the alternative design favored by the liner advisory committee can be summarized as:

1. The need for a double composite liner. The liner advisory committee favored using only one composite liner with the other liner being a single component liner such as an FML.
2. The requirement for 2 feet of low permeability soil (clay) (hydraulic conductivity of 10-7 cm/sec or less) in the secondary liner. The liner subcommittee preferred using a GCL as the soil component of the composite liner requirement. Alternatively, the liner advisory committee also advocated for using soil of a higher hydraulic conductivity (10-6 cm/sec) if a thick soil component had to be required in the secondary liner.

In choosing a double composite liner for the recommended design the Department weighed the following considerations:

1. Recognition that a base liner is the fundamental environmental protection element of the landfill design. Therefore, it should be designed conservatively to provide long-term protection and ability to withstand foreseeable, even low probability, potential failure mechanisms.
2. The best reasonable design should be used. Have the design incorporate effective proven liner technology into each liner component of the double liner system.
3. Incorporate the existing composite liner design standards (2 feet of low permeability soil and an FML) into the revised double liner requirement. This composite liner design has a long and successful performance record in Massachusetts and throughout the country and should be a component of the double liner requirements.
4. Recognition that building a liner is a one-time event. There is only one opportunity to do it well and problems cannot readily be repaired after waste has been placed.
5. Require a double liner system that minimizes leaking potential. Composite liners have lower leakage rates than single component liners.
6. Redundancy provides appropriate protection of public health and the environment. Require each liner of the double liner system to be an effective stand-alone liner.
7. Differentiation. Incorporate a variety of different materials in each liner to reduce chances of a systemic failure.

A comparison of the components of the existing regulatory standard for a single composite liner, the proposed double liner requirements and the alternative double liner design supported by the advisory group is presented in Table 1. A brief discussion of those differences follows in Table 2. We encourage the reader to review this discussion, which will assist the reviewer in considering this issue.

Table 1. Liner Designs

Component	Single Composite Liner (Current regulatory standard)	Proposed Double Composite Liner	Alternative Double Liner
<ul style="list-style-type: none"> Primary Leachate Drainage and Collection Layer 	<ul style="list-style-type: none"> 12" of 10^{-2} cm/sec soil and 6" of 10^{-3} soil 	<ul style="list-style-type: none"> 12" of 10^{-2} cm/sec soil and 6" of 10^{-3} soil 	<ul style="list-style-type: none"> 12" of 10^{-2} cm/sec soil and 6" of 10^{-3} soil
<ul style="list-style-type: none"> Primary Liner 	<ul style="list-style-type: none"> 24" of 10^{-7} soil (clay) and a FML or 12" of 10^{-7} soil (clay), a GCL and a FML 	<ul style="list-style-type: none"> FML and a GCL or 12" of 10^{-7} soil and a FML 	<ul style="list-style-type: none"> FML only or FML and a GCL
<ul style="list-style-type: none"> Leak Detection and Secondary Collection 	None	<ul style="list-style-type: none"> Geonet or 12" of 10^{-2} soil 	<ul style="list-style-type: none"> Geonet or 12" of 10^{-2} soil
<ul style="list-style-type: none"> Secondary Liner 	None	<ul style="list-style-type: none"> 24" of 10^{-7} soil (clay) and an FML or 12" of 10^{-7} cm/sec soil (clay), a GCL and a FML 	<ul style="list-style-type: none"> FML only, if FML/GCL used in primary liner or FML and a GCL or FML and a GCL and 10^{-6} soil

Table 2 - Double Liner Design Considerations

Proposed Double Composite Liner	Alternative Double Liner Designs														
<p align="center">Double Liner Design Concepts</p> <table border="1"> <tr> <td data-bbox="96 363 968 630"> <ul style="list-style-type: none"> • Require double composite liner (2 composite liners) • Use existing composite liner requirements for secondary liner (2 feet of soil and a FML) <ul style="list-style-type: none"> • Add a leak detection /secondary collection layer • Add a primary composite liner (such as a GCL/FML combination) </td><td data-bbox="968 363 1845 630"> <ul style="list-style-type: none"> • Require 1 composite liner (such as a GCL/FML combination) and 1 single element liner (such as an FML only) • Look at double liner design as a new concept – do not, necessarily, build design around existing composite liner requirements </td></tr> </table>		<ul style="list-style-type: none"> • Require double composite liner (2 composite liners) • Use existing composite liner requirements for secondary liner (2 feet of soil and a FML) <ul style="list-style-type: none"> • Add a leak detection /secondary collection layer • Add a primary composite liner (such as a GCL/FML combination) 	<ul style="list-style-type: none"> • Require 1 composite liner (such as a GCL/FML combination) and 1 single element liner (such as an FML only) • Look at double liner design as a new concept – do not, necessarily, build design around existing composite liner requirements 												
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Proposed Double Composite Liner	Alternative Double Liner Designs
Secondary Liner Design Concepts	
<ul style="list-style-type: none"> Proposed regulation calls for 24 inches of 10-7 cm/sec soil (compacted clay liner - CCL) and an FML 	<ul style="list-style-type: none"> If the primary liner was a single FML then secondary liner would be GCL/FML combination or 24" of 10-6 cm/sec soil with a GCL and FML. Because 10-6 soil is more readily available and easier to work with, substituting it for 10-7 soil will save time and money with little reduction in overall environmental protection value
<ul style="list-style-type: none"> There is a long history of successful and effective use of this type of composite liner in Massachusetts and throughout the USA 	<ul style="list-style-type: none"> GCL/FML have proven to be successful and effective liners for 10 or more years
<ul style="list-style-type: none"> CCLs prevent diffusion transport of organic compounds 	<ul style="list-style-type: none"> GCL/FML may not prevent diffusion transport, but combined with 10-6 soil they will
<ul style="list-style-type: none"> The thickness of the CCL resists injury from catastrophe events such as fires, punctures or even slope failures 	<ul style="list-style-type: none"> Catastrophe failures are remote possibilities and should not be over compensated for in a landfill design. Also: <ul style="list-style-type: none"> Fires are a remote possibility and occur in the upper parts of a LF away from liner systems Penetrations that effect the secondary liner will first affect the primary liner and thus will be detected by the leak detection system Other catastrophe failures such as slope failures are self-evident
<ul style="list-style-type: none"> If all other components fail a thick natural clay layer will offer a residual protection layer 	<ul style="list-style-type: none"> Corrective actions will be necessary to address a failure of major proportions, in the interim 10-6 material will provide sufficient residual protection
<ul style="list-style-type: none"> Because the secondary liner cannot be monitored after construction it is important that it be conservatively designed 	<ul style="list-style-type: none"> Using 10-6 soil or a GCL instead of 10-7 soil will result in a conservatively designed secondary liner

7. Design Requirements for Ash Monofills (19.119)

Additional Operation and Maintenance Requirements for Ash Monofills (19.131)

The Solid Waste Regulations incorporated a former DEP policy requiring Municipal Waste Combustor (MWC) ash to be disposed in ash-only landfills or monofills. DEP developed this requirement because of concerns that mixing unburned MSW with ash could increase the potential for leaching of heavy metals from the ash because it was expected that leachate from MSW would be acidic, which would in turn have a negative impact on the quality of groundwater. In addition, by policy², MWCs are required to maintain a minimum of six months of bypass disposal capacity. This capacity is required to ensure that during times of equipment failure or other emergencies at the MWC, contract MSW tonnage can be properly disposed in a landfill if it cannot be burned. DEP believes that bypass capacity is necessary to ensure that MSW can be easily disposed of when there is an unanticipated shutdown of a MWC. While most MWCs try, during such events, to bypass waste to other disposal facilities to the extent possible, thereby preserving capacity in their ash landfill, this is not always possible. To meet this bypass requirement MWCs have traditionally set aside a separate area in the landfill to dispose of bypass waste. Some facilities have never had to make use of their bypass capacity, while others have had to use some of this space when the facility was not operating or during scheduled maintenance.

During development of the Beyond 2000 Solid Waste Master Plan, two Municipal Waste Combustor (MWC) operators separately requested that the Department reexamine the Department's ash monofill requirement. At that time, the Department indicated that it was willing to look at this issue when it revised the solid waste regulations and asked the two operators to submit data and any other relevant information regarding leachate quality from their ash monofills, co-disposal landfills and MSW only landfills to support their request. In October, 2001 both operators submitted letters asking DEP to review this requirement and supplied data and other information supporting their requests.

The Department has reviewed the requests and the data submitted in support of those requests and is proposing to eliminate the requirement that ash must be disposed of in an ash-only landfill or monofill, or be placed hydraulically upgradient of MSW if disposed in the same landfill. There are several reasons the Department is proposing this change to the regulations:

² Policy on Ash and Bypass Waste Landfill Capacity for Solid Waste Combustion, Policy #SWM-7, May 13, 1987

- The data submitted to the Department in support of eliminating the ash monofill requirement indicates that there is little difference between leachate quality from MWC ash monofills and MSW landfills, especially with regard to concentrations of metals. There is now a significant body of data on MSW-only landfills, ash and MSW co-disposal landfills, and ash-only landfills between which comparisons can be made. This body of data did not exist when DEP instituted the requirement to dispose of ash in monofills, but clearly shows that initial concerns that certain heavy metals would leach at higher rates in co-disposal landfills has been demonstrated to not be the case.
- At least 23 states allow co-disposal of ash and MSW, including several states that burn a large percentage of their MSW such as Florida and New York.
- All new landfill cells constructed at ash landfills will be required to be constructed with more protective double-liner systems in compliance with the proposed new liner standards presented elsewhere in this document. These double liner standards are being adopted to increase protection to ground and surface water by providing leak detection and a secondary leachate collection system. Leachate collected by these very protective liner systems will then be treated at wastewater treatment facilities.
- The modification will allow for more efficient operation of ash landfills because the change will eliminate the need to maintain two separate areas at the landfill, one for ash and one for bypass MSW. This will therefore allow for better sequencing of operations. Furthermore, the change in operations that this change will allow will save disposal capacity by reducing the need for daily cover since only one working face will be required at such a landfill.

In summary, the data submitted to DEP in support of elimination of the ash monofill requirement shows:

- The average pH of leachate from MSW, co-disposal and ash landfills to be within a similar range (MSW – 7.2; Co-Disposal – 7.4; Ash – 6.9)
- Concentrations of salts are higher in ash-only landfills than in either co-disposal landfills or MSW landfills.
- Concentrations of heavy metals in landfill leachate from sites where ash is co-disposed with MSW are within the range seen at MSW landfills and ash-only landfills. (average lead concentration is <0.016 mg/l for MSW landfills; <0.013 mg/l for co-disposal and 0.047 mg/l for ash landfills)
- Concentrations of several metals found in leachate from co-disposal sites are often below their respective Primary Drinking Water Standards.
- As expected, chemical oxygen demand (COD) and biochemical oxygen demand (BOD) are lower in ash-only landfills (avg. 935 and 180 mg/l respectively) than in MSW (1,046 and 443 mg/l respectively) or co-disposal landfills (3,672 and 2,213 mg/l respectively) due to the higher organic content of MSW.

The proposed elimination of the ash monofill requirement will reduce costs for Municipal Waste Combustors (MWCs) by allowing for more efficient use of landfill resources. Facilities will no longer need to maintain two separate work areas at the landfill, one for ash and the other for trash. This will improve the sequencing of activities at the landfill and result in more efficient use of the space available. This change in law, which will lower the cost to operate an ash

landfill, should be passed on to contract communities in the form of lower tipping fees. Facilities will no longer be required to maintain hydraulically separate capacity for ash and unburned municipal solid waste

To complement the elimination of the monofill requirement DEP is also proposing several revisions to the operation and maintenance requirements for ash monofills whereby the requirement to dispose of ash separately from other wastes will be removed.

8. Landfill Operation And Maintenance Standards (19.130)

Daily Cover – 19.130(15)

The Department is proposing to incorporate in the cover material requirements an upper limit on the amount of daily cover that can be used at landfills to no greater than 20% by weight of the waste disposed to prevent excessive use of daily cover and in particular alternative daily cover materials. Excessive use of cover material reduces the volume available for solid waste. This standard has already been adopted in numerous BUDs issued by the Department for use of alternative daily cover materials.

Intermediate Cover – 19.130(15)

The regulations have been modified to provide more flexibility on the time period for applying intermediate cover to an area that is not currently taking waste. The regulations now require application of 6 inches of intermediate cover on any area of the landfill that will not receive waste for 30 days and 1 foot on areas that will not receive waste for 6 months or longer. This section has been modified to allow a different time period, as approved by the Department, to apply. For example, longer time periods may be approved by the Department based on the sequence of operations for the facility, how long it will be before that area of the landfill will be used again for disposal and the probability of nuisance conditions developing.

The primary purpose of intermediate cover is to prevent erosion and to reduce infiltration of water into the waste. The regulation is proposed to be modified to specify that this requirement applies to **exterior** top and side slopes. Exterior top and side slopes are the areas of the landfill that the Department is most interested in ensuring are stable. For interior areas of the landfill, all water running off the waste disposal area will be captured by the leachate collection system and erosion is not as much of an issue since the area will continue to be filled over time.

Final Cover – 19.130(15)

Final cover is required to be applied to a landfill within 90 days, or other Department approved schedule, from the time the landfill reaches final elevations, whenever a phase has been completed or when the permit terminates or is revoked. Final cover is also required whenever a new lift of waste will not be placed for one year. This last requirement has been modified such that it is triggered only when the area is not permitted to accept additional waste. It makes no sense to apply a final cover only to have to strip it off later for a new lift that has already been permitted. Under this situation intermediate cover is appropriate.

Top Slope and Side Slopes – 19.130(18)

This section was modified to clarify that it is the final top slope that must be at a 5% grade and the final exterior side slopes not exceed a 3:1 slope. Landfill operators will operate with an interior slope that is closer to a 2:1 slope. During the operational phase of the landfill this may be an acceptable practice. However, this section was also modified to disallow unstable slopes or ones that put too much stress on the liner system.

Storm Water Drainage – 19.130(19)

On lined landfills, during and after storm events, a normal stormwater management method is to allow controlled ponding of the stormwater over the lined area. This controlled ponding results in slow stormwater seepage into the landfill and allows better management of the stormwater by minimizing the potential for water that has contacted waste materials to flow to beyond the limit of the lined area. Slow seepage through the waste mass also allows the operator to collect stormwater from the primary liner over a longer time period. This minimizes the peak leachate discharge rate reducing the daily maximum number of leachate hauling vehicles and the leachate load at the receiving treatment facility.

Erosion Control – 19.130(20)

On lined landfills, a normal stormwater management method during and after storm events is to allow controlled ponding of the stormwater. This controlled ponding slows seepage of water into the landfill and allows better management of the stormwater by allowing the operator to collect it on the liner for collection and treatment over a longer time period. On the other hand, uncontrolled ponding may result in erosion from the landfill or cause slumping of waste materials due to saturation of the waste by water. Because controlled ponding is an allowable method to manage stormwater, the word “uncontrolled” was added to this provision to distinguish it from a controlled situation.

Boundary and Elevation Markers – 19.130(21)

DEP proposes to delete the need to maintain elevation markers on all active and inactive phases of the landfill and replace that requirement with a requirement to maintain at least one reference elevation marker on a part of the site that does not contain solid waste.

Leachate Collection, Treatment and Disposal – 19.130(30)

The current regulation allows a maximum of one foot of hydraulic head on a liner except during storm events. Storage of leachate in the current regulation is required to drop below 1 foot within 24 hours of a storm event. The proposal is to extend this storage period and allow storage of storm water on the liner for up to 7 days during the primary operational phase of the landfill. This is a standard method of managing storm water that has fallen on the landfill.

Inspections – 19.130(35)

The regulation was modified to extend the period of time for submittal of an inspection report to the Department from seven to fourteen days after the inspection occurs.

Re-Circulation of Leachate – 19.130(36)

A new regulation is proposed to address re-circulation of leachate. Interest in re-circulation of leachate back onto a landfill has been growing over the past several years as a better way to

manage a landfill. Re-circulation is intended to speed up the rate of decomposition of a landfill so that it stabilizes over a much shorter time period than if no re-circulation occurs. Furthermore, the landfill may not have to send as much leachate off-site for treatment, which saves money for the operator. The Department is comfortable that with a double-lined landfill re-circulation is an acceptable landfill operation that should not compromise the landfill.

The proposed addition to the regulations provides for Department review and approval of leachate re-circulation proposals upon submittal of a report which addresses the goals and expectations of the project, engineering considerations, impact on odors and other nuisance conditions, monitoring of the performance and an evaluation of the need for a financial assurance mechanism (FAM).

9. Environmental Monitoring Requirements (19.132)

DEP is proposing several amendments of the environmental monitoring requirements (310 CMR 19.132).

Identifying a Need for Groundwater Cleanup:

During discussions about revising the Risk Evaluation Guidance for Solid Waste Facility Site Assignment and Permitting to address the need to evaluate groundwater contamination and propose remediation (if necessary) during site assignment or expansion of a facility, the issue of where the compliance point is for groundwater arose. While all operating landfills monitor the groundwater in their vicinity, there is some confusion about what groundwater standards apply, and how the monitoring data should be compared to the applicable standards to identify any need for development of a remediation plan. The issue of what groundwater standards apply was addressed in 1994, with the creation of the “Adequately Regulated” section of the Massachusetts Contingency Plan (MCP) specifically for Solid Waste Management Facilities (310 CMR 40.0114, which was referenced in the Solid Waste Regulations at 310 CMR 19.013(2)).

In the discussion, it was apparent that two issues needed to be clarified in the Solid Waste Regulations:

- a) **Location of the “point of compliance”**, at which groundwater from a landfill must meet applicable standards of the Solid Waste Program. This “point” is used to determine whether a facility owner or operator needs to develop a plan for further assessment and cleanup of groundwater where contamination exceeds the applicable standards.

The Department established the “point of compliance” for groundwater several years ago in its Landfill Technical Guidance Manual as a result of discussions with EPA during its review of the Department’s solid waste program under Subtitle D of the Resource Conservation and Recovery Act (RCRA). EPA’s Subtitle D regulations (which are minimum standards for state solid waste programs) establish the point of compliance for groundwater monitoring at landfills at CFR 258.40(d) as:

The relevant point of compliance specified by the Director of an approved State shall be no more than 150 meters from the waste management unit boundary and

shall be located on land owned by the owner of the MSLF [Municipal Solid Waste Landfill] unit.

In EPA's review of DEP's solid waste program, EPA asked DEP to establish such a "point of compliance". DEP complied by defining the "point of compliance" for groundwater in the Landfill Technical Guidance Manual. Page 8-3 of the Manual establishes the point of compliance for groundwater monitoring:

The groundwater point of compliance for solid waste landfills is 150 meters from the edge of the system designed to control waste or the property line, whichever is less.

The Department now proposes to modify the solid waste regulations to include a definition of "point of compliance".

b) Assessing the full nature and extent of groundwater contamination from a landfill.

Recent reviews of groundwater assessments supporting proposals to expand existing landfills indicate that there is confusion about the need to evaluate groundwater contamination beyond the facility's point of compliance. While DEP's Solid Waste Program has not always required contaminated groundwater beyond the "point of compliance" to be addressed, the facility must still comply with the requirements of MGL c. 21E (the "Massachusetts Superfund Law") and the Massachusetts Contingency Plan. The "adequately regulated" provisions of the MCP exempt facilities from many of the Waste Site Cleanup procedural requirements, but do require that a full assessment and risk characterization be made.

The MCP requires that contamination in groundwater that has moved beyond the "point of compliance" to be assessed and its risks characterized using the Risk Characterization standards of the MCP. These standards (found in Subpart I of the MCP) require that the nature and extent of the contamination be adequately identified, and the groundwater categorized as to whether it is a current or future drinking water source area, a source of vapors in enclosed structures (for volatile contaminants), and/or a threat to surface water bodies which the groundwater eventually reaches.

While these provisions were established in the MCP (310 CMR 40.0114) and in the Solid Waste Regulations (310 CMR 19.013(2)) in 1994, the recent discussions about how these rules apply to landfills for which expansions are proposed indicate that a clarification is needed. Therefore, DEP is proposing to amend 310 CMR 19.132(j) to accomplish this.

Models for Landfill Closures and Remedial Actions

The discussions regarding the point of compliance and cleanup standards for groundwater outlined above also raised questions about how well the current models for conducting landfill closures and remedial actions work and whether the Department should consider other alternatives.

The Department currently has two models for conducting landfill closures and remedial actions at solid waste landfills: the solid waste model, and the 21E model. The current models are set up so that a landfill facility owner/operator is only required to operate in one regulatory universe. Therefore, if a solid waste facility is to undergo remediation under the Solid Waste Regulations, the owner will only need to be permitted by the solid waste program. If a landfill is closed and capped under the solid waste program, and the landfill is “adequately regulated”, then the owner may conduct remedial actions that address contamination that has moved beyond the point of compliance under oversight of the Solid Waste Program as long as certain MCP cleanup standards are met. In the same fashion, for closure and remediation of an old industrial landfill that is not considered to be “adequately regulated” (i.e. never had a solid waste permit, operated before 1971, etc.) the closure and remedial actions can be accomplished under the MCP and be overseen by a Licensed Site Professional.

There is a third and a fourth model that the Department would like to explore. This third model would require a facility owner/operator to close and cap a landfill and conduct on-site assessment activities under the solid waste regulations, but would allow any assessments and remedial actions that may be necessary for contamination that has moved beyond the point of compliance to be accomplished under the direction of a Licensed Site Professional (LSP) and the MCP regulations. The fourth model would be to apply the current 21E Model to landfills that are currently adequately regulated.

In summary, the four models for closing, capping, assessing and cleanup of solid waste sites are:

1. Landfill was permitted and operated after 1971 – closure, assessment and remedial actions permitted by Solid Waste (considered adequately regulated by the MCP if in compliance with Solid Waste regulations). If there is contamination beyond the point of compliance, cleanup will need to meet the MCP standards. (Solid Waste Model)
2. Landfill was never permitted, or operated before 1971 (not adequately regulated) – closure, assessment and remedial actions proceed using an LSP pursuant to the MCP. Cleanup of contamination will need to meet MCP standards. (21E Model)
3. Landfill was either adequately regulated or was an illegal landfill – closure and capping of the landfill is permitted under the solid waste regulations. Assessment and cleanup of contamination beyond the point of compliance is done under direction of an LSP and meeting the MCP standards. (Mixed Model)
4. Allow #1 to be done under the MCP. (Expanded 21E Model)

The first two models (the Solid Waste Model and the 21E Model) are currently in place and used by the Department. The third model (Mixed Model) and fourth model (Expanded 21E Model) are not currently in use. DEP is considering further exploration of this issue. ***Your feedback – pros and cons, comments, and suggestions – will be helpful.***

- ***How well would closure of solid waste facilities fit into the MCP framework?***
- ***Will the Mixed Model and Expanded 21E Model be more or less protective of public health, safety and the environment, or will they be the same when compared to using the Solid Waste or the 21E models?***
- ***Will the Mixed Model or Expanded 21E Model save the landfill owner/operator time and money?***

- *Are there particular issues that will arise as a result of use of the Mixed Model or Expanded 21E Model?*
- *Will the Mixed Model or Expanded 21E Model be more efficient with regard to use of DEP resources?*

Sampling Parameters:

The requirement to submit monitoring results “within 60 days after the scheduled sampling period” has been modified to require results to be submitted “within 60 days after the date of sample collection.”

The regulations have been modified to provide flexibility to DEP to modify the list of parameters to be sampled for based upon past sampling results. In addition, three parameters are proposed for addition to the list of standard sampling parameters. Calcium and Sodium have been added to the list of indicator parameters because elevated concentrations can be indicative of a leachate plume and they travel quickly. 1,4 dioxane is proposed to be added to the list of organics. 1,4 dioxane is used as a solvent for varnishes, paints, dyes, and lacquers. It is readily dissolved in ground water, will not typically sorb to soil, and will not readily volatilize from ground water, thus making this compound more persistent in the environment. It is also a probable human carcinogen and has been found in plumes at landfills often enough that the Department believes it should be a standard sampling parameter.

Practical Quantitation Limits:

The regulations have been modified by adding a requirement that the practical quantitation limits for sampling must be at or below the applicable standard being sampled for. In the past, some operators have submitted sampling results to the Department where the detection limits used were above the standards used to determine if there is a problem at the landfill (i.e., the Maximum Contaminant Levels or MCLs).

10. Landfill Closure and Post-Closure Requirements (19.140 and 19.142)

Clarifications were added in the form of references to the Landfill Assessment Requirements at 19.151 to clearly link the closure section with the assessment section of the regulations.

A requirement was added to the post-closure requirements to make clear that a closed landfill should be inspected at least annually by a third party consulting engineer and the results of such inspections submitted to DEP. This is done for the operating life of landfills and has been an expectation of the Department for closed landfills.

11. Handling Facility Requirements (19.200 – 19.207)

This section of the regulations was originally added to the solid waste regulations in 1994. The section consists of the old Transfer Station Regulations, 310 CMR 18.00. Those regulations were simply added on to the end of the Solid Waste Regulations with no modifications, other than renumbering, so that there would be one set of regulations for regulating solid waste management facilities.

The transfer station regulations have been modified to make them applicable to all handling facilities in addition to transfer stations. The section has been reorganized into design requirements and operation and maintenance requirements. A number of standard operation and maintenance requirements have been added as well, in many cases replacing similar requirements that were less specific or detailed.

In addition, the Department has added a statement to 310 CMR 19.203, Additional Requirements, indicating that the Department may require a facility to conduct monitoring of air and/or surface water or ground water in response to conditions that have developed at a facility, such as dust or odor problems. Unlike for landfills, monitoring is generally not required at solid waste handling facilities. Therefore the Department wants to make it clear in the handling facility regulations that monitoring could be required in response to conditions that have developed on the site to determine whether those conditions are a threat to public health, safety or the environment.

COST/BENEFIT ANALYSIS

The proposed revisions to the Solid Waste Management Facility Regulations will result in associated costs and benefits to facility operators, the public, waste generators and DEP. Some of these costs and benefits can be summarized in monetary terms, while others are less amenable to a quantitative analysis. The discussion below seeks to provide both quantitative and qualitative analyses of some of the costs and benefits of the proposed revisions to the Solid Waste Regulations. While some revisions, such as the double liner requirement, will increase the capital costs of constructing a landfill, other modifications will reduce operational costs, such as the elimination of the ash monofill requirement.

Many facilities with long term contracts include “change of law” provisions in their contracts. Increased costs resulting from modifications to statutes and regulations can, under a change in law provision, be passed on to those with a contract. Cost increases resulting from regulatory revisions therefore become a major issue not just for the facility owner and operator, but also for municipalities that contract with those facilities as they may end up bearing future costs. However, as noted below, several of the revisions to these regulations will reduce the costs to operate a solid waste facility. Just as facilities expect to pass on cost increases due to new or revised regulations to their customers, the savings realized by modifications to the regulations, such as the proposed elimination of the ash monofill requirement, are expected to also be passed through to a facility’s customers in the form of reduced tip fees.

1. Waste Ban for C&D Materials (19.017)

Several materials typically found in construction and demolition (C&D) waste are proposed for addition to the list of banned materials. The materials include asphalt pavement, brick, concrete, metal and wood. Facilities will be required to develop and implement waste ban plans to address the ban on these materials.

The costs and benefits of the addition of C&D waste materials can be looked at from the perspective of the type of facility affected. The major benefits of implementing the new bans are summarized as follows:

- Decrease in the quantity of C&D waste requiring disposal at solid waste disposal facilities
- Increase in materials diverted from the C&D waste stream for recycling
- Significant investment in solid waste processing infrastructure by the solid waste industry resulting in an increase in jobs
- Development of new markets for beneficial use of the materials

From the perspective of the solid waste management facilities that will need to come into compliance with the waste bans there will be added costs for implementation. Costs will result from the need to conduct inspections of loads entering the facility to ensure they do not contain unacceptable amounts of the banned material and, in some cases, separating banned materials from loads of waste prior to disposal or transfer for disposal. However, in the Draft Guidance for implementation of the waste bans, the Department has provided several options that will make it easier and less costly for facilities to meet the bans than if they had to separate materials

themselves. For example, many of the smaller transfer stations will not need to conduct load inspections to comply with the new bans and will therefore incur little or no added costs. The proposed Guidance for Solid Waste Handling and Disposal Facilities on Compliance with DEP's Waste Control Restrictions states that: transfer stations that do not accept commercial loads or waste from private haulers may not need to conduct comprehensive load inspections if construction and demolition debris is delivered in vehicles with less than a five (5) cubic yard capacity. Most passenger vehicles and pick-up trucks have less than five (5) cubic yard capacity.

Furthermore, the Department has established that it is reasonable for facilities to accept loads of solid waste with de minimis quantities of the banned materials. The Draft Guidance indicates that asphalt pavement, brick, concrete, metal and wood should be estimated as a percentage of the container load volume. An acceptable quantity is 20% or less by volume of the cumulative total of asphalt pavement, concrete, metal and wood.

Finally, another way facilities can comply with the new waste bans will be to transfer mixed loads of C&D material to facilities that separate and/or process the materials for recycling and reuse. In the case of restricted construction and demolition debris, restricted materials (i.e., asphalt pavement, brick, concrete, metal and wood) may be transferred to facilities that have an approved Waste Ban Compliance Plan, or can demonstrate that they will not accept restricted material for disposal, or further transfer for disposal. Therefore, a transfer station that accepts mixed loads of C&D material can comply with the new waste bans by transferring loads of C&D waste to a C&D waste processing facility, which in turn separates out the asphalt pavement, concrete, brick, metal and wood for recycling or other beneficial uses.

From the perspective of the facilities that will process and/or use separated materials, a major benefit of the new waste bans is that they will help to establish a market for the materials by ensuring that there will be a supply of the separated materials to recycle or reuse. Over the past several years new C&D processing facilities and modifications to existing facilities have been built in response to the proposal in the Beyond 2000 Solid Waste Master Plan to expand the waste bans to include C&D materials. This has significantly expanded the capacity available for processing C&D waste. With the proposal to establish new waste bans and the parallel development of waste processing capacity, end users of separated materials have expressed interest in locating in Massachusetts to take advantage of the new supply of materials that will result from implementation of the new waste bans.

From the perspective of construction and demolition contractors there are also significant benefits as a result of the proposed waste bans where the contractor is able to separate recyclable materials at the job site. In order to examine possible costs and benefits to contractors of the proposed waste bans, DEP's Construction and Demolition Debris Subcommittee initiated several construction and renovation pilot projects to demonstrate source separation techniques and to measure the costs and benefits associated with diverting C&D debris from disposal. Contractors volunteered to participate in these case studies and provided financial data to DEP, allowing the development of "fact sheets" outlining their findings (these case studies can be viewed at <http://www.state.ma.us/dep/recycle/business.htm>). To date, two pilot projects have been published which demonstrate the significant savings contractors have realized by separating C&D material and diverting it to reuse and/or recycling markets. For example, at the Milford

Fire Station renovation project the contractor was able to divert 83% of the waste materials to reuse and recycling, thereby saving over \$21,000 in avoided disposal costs. At the St. Paul's Cathedral renovation project the contractor diverted 79% of the waste materials to reuse and recycling for a cost savings of over \$23,000.

In addition, some construction and demolition debris processing facilities have adjusted their tip fees to offer solid waste haulers a reduced fee for separated C&D materials (e.g. wood) delivered to their facilities. These reduced tip fees are significantly below the tip fees for waste disposal at landfills.

2. Applicability and review criteria for permits (19.038)

The draft regulations incorporate two major modifications to the permitting criteria that apply to all types of solid waste management facilities. Both modifications add permitting criteria to the Solid Waste Regulations that were previously added to the Site Assignment Regulations, 310 CMR 16.00. The first of these is the rewritten language regarding endangered species. The permitting criterion for endangered species was different than that used in the siting regulations. The proposed modification simply carries over the language used in the siting regulations to the permitting regulations. For this modification there should be no additional cost to an applicant because an applicant will use the same process previously used, i.e., consulting with the Natural Heritage program at the Division of Fisheries and Wildlife, on whether an area has any rare, endangered or special concern species. The major benefit from the revision is simply that the regulatory language in both the siting and the permitting regulations will now be the same, eliminating any confusion. While the existing regulation referred to the Federal Endangered Species Act and the revised language refers to the Commonwealth's program, species that are listed under the Federal program that are found in Massachusetts are also listed by the Natural Heritage Program at Fisheries and Wildlife.

The second modification to the permitting criteria is the addition of what DEP has called the cumulative impact criterion whereby applicants for a permit must determine whether the proposed facility's impacts, when added to the impacts already existing from other sources in the area, will pose a threat to public health, safety and the environment. Addition of this criterion will result in no additional cost to an applicant who has already conducted this analysis during site assignment for the facility. However, for a facility with an existing site assignment where the applicant is proposing to expand the facility, the cumulative impact criterion will result in added costs to the applicant to assess other sources of contamination in accordance with the revised Guidance and to implement Best Management Practices (BMPs) where the facility may not have already been proposing them in their permit application. The benefits of adding this criterion include leveling the playing field for all solid waste management facilities such that all will need to meet this criterion, whether they have had to do so through the site assignment process or are only subject to permitting requirements; ensuring that the facility will not result in a cumulative risk to public health, safety or the environment where there are other sources in the local area; and implementation of BMPs at all facilities which will result in decreased nuisance conditions and impacts to public health, safety and the environment;

3. Beneficial Use Determinations (19.060)

The current Beneficial Use Determination (BUD) regulations use a one-size-fits-all approach to review and approval of applications for beneficial use of solid wastes. The revised BUD regulations propose to eliminate this one-size-fits-all approach and replace it with a tailored approach whereby the application and review of a BUD are categorized based upon the type of use proposed and the potential risks of the proposed use to public health, safety and the environment. Simple BUD proposals that pose little risk and are less complex will require only minimal review. These simpler applications will be less expensive to prepare and require less review time by DEP. At the other end of the spectrum, proposals that will result in unrestricted land application of waste materials are more complex and will require more complicated applications, including risk assessments, to demonstrate no significant risk to public health, safety and the environment. These more complex applications will require more review by DEP than simpler proposals.

The benefits of the proposed regulation are that it will provide a customized application and review process tailored to the level of risk of the beneficial use proposal. Simpler applications will get a quicker review whereas more complicated projects with higher potential for risks will receive a more in-depth review. In addition, the regulations also provide detailed review criteria for each category of use. This will provide clearer standards for both the applicant and the Department as to what the criteria for approval are. This tailored process therefore benefits both applicants and the Department.

The cost of the new BUD regulations will depend upon the category of reuse proposed. Simple applications will be relatively inexpensive to prepare, the major criterion being to compare the product made with a waste material to the product made with the materials normally used. These simple applications will be less expensive to prepare and review than applications required under the current BUD process.

As proposed uses get more complicated, applications will become more expensive to prepare. A waste material proposed to be land applied will require an extensive sampling and analysis program to test the waste material to determine whether there are contaminants of concern and at what concentrations. In most cases it will be necessary to conduct a risk assessment to examine the levels of contaminants, identify the sensitive receptors and to determine whether there are pathways for contamination to reach sensitive receptors. This type of detailed analysis will be more costly to prepare and require more time for the Department to review, but is necessary to identify if there are any significant risks with the proposal.

The application fee for BUD applications was recently increased from \$900 to \$1,120 for a Major BUD application, regardless of the complexity of the proposed application. The cost to the Department to review more complicated BUDs is not covered by this low application fee. One major benefit to DEP of changing the BUD regulations will be that the Department will establish new permit fees that are tailored to the expected amount of review time for each category of BUD application.

4. Ground water protection system design and performance standards (19.110 – 19.111)

While the change from requiring a single composite liner to a double composite liner system will increase the costs to construct a landfill, the change will also result in significantly greater assurance that leachate will not escape from the landfill to contaminate surface water and ground water resources. The Department believes this added insurance is cost effective for ensuring protection of public health and the environment from the impacts of leachate from landfills.

Double liners increase protection of ground water and surface water resources and therefore public health, safety and the environment. By incorporating a double composite liner design with a leak detection layer, leaks of the primary, or uppermost liner, will be detectable and will allow for correction of the problem. Leachate that leaks through the primary liner will be captured by the secondary leachate collection system for proper management. Leaks are therefore not only detected, but leachate is also collected and properly managed. The regulations establish an Action Leakage Rate (ALR) that sets a leakage standard. Should the ALR be exceeded, assessment and correction of the problem will be necessary. Under the current regulations, only a single composite liner is required which does not provide either a leak detection function or the ability to capture leachate that has leaked through the liner. Therefore, the proposed double composite liner requirement is a significant improvement from the perspective of protecting groundwater and surface water resources.

The insurance provided by a double liner system does come with an added cost, however. DEP assumes that the increased cost of constructing a double liner will be passed through to those customers using a facility for waste disposal in the form of higher tip fees. However, in many cases the tip fees charged at a landfill reflect market forces of supply and demand and a customer may well not see any increase in tip fees. Those customers that are most likely to see an increase in tipping fees will be those with long term contracts with facilities where the contract allows the cost of a “change in law” to be passed through to the customer. However, the Department believes that the increased cost of a double liner will also reduce the potential for contamination of ground and surface water resources that would require future remedial measures and the costs associated with a cleanup effort. Furthermore, remediation of a single liner system where the system fails not only results in contamination of groundwater, but will result in either loss of landfill capacity if the decision on remediation is to close and cap the landfill before the capacity is used up or expensive remediation to locate the damaged area, remove the overlying waste and repair the damage.

For the purposes of a cost/benefit analysis, the differences between the current single composite liner requirement and the proposed double composite liner requirement can be summarized as seen in Table 1.

Table 1. Comparison of Components in a Single Composite Liner versus a Double Composite Liner

Current single composite liner components	Proposed double composite liner components (Secondary composite liner and a primary composite liner)
Prepared subgrade	Prepared subgrade
2 feet compacted clay layer (CCL) or 1 foot CCL and Geosynthetic clay liner (GCL)	2 feet compacted clay layer (CCL) or 1 foot CCL and Geosynthetic clay liner (GCL)
Flexible membrane liner (FML) (These two components are the single composite liner)	Flexible membrane liner (FML) (These two components are the secondary liner)
	Leak detection and secondary collection system (usually a geonet)
	Geosynthetic clay liner (GCL) Flexible membrane liner (FML) (This is the primary liner)
Leachate collection and removal system	Leachate collection and removal system
18 inches sand drainage/protection layer	18 inches sand drainage/protection layer

Cost of a Double Composite Liner

Discounting the common components of both designs, a summation of the additional costs for the proposed double composite liner are those costs associated with increased engineering, additional materials (leak detection layer, GCL and FML), installation cost increases due to the difficulty of constructing a more complex design, additional Quality Control/Quality Assurance efforts, and possibly operational cost increases.

To categorize these cost differences the Department presents information below on:

- Costs of the additional materials needed for the primary liner and leak detection/secondary collection system since these are the additional components required in the double liner design (see Table 2.)
- Costs for both types of liners constructed in Massachusetts, as well as national information.

Table 2. Costs Associated with the Primary Liner of a Double Composite liner System

Item	Cost per square foot	Average installation cost	Total cost per square foot	Average installed cost per acre
60 mil FML (smooth)	\$0.26	\$0.17	\$0.43	\$18,731
Geosynthetic Clay Liner	\$0.44	\$0.10	\$0.54	\$23,522
Biplanar geocomposite (geonet)	\$0.38	\$0.12	\$0.50	\$21,780
Total installed cost of materials per acre				\$64,033

Table 3 includes a comparison of the costs of a single composite liner versus a double composite liner. These values were generated from several sources - recent costs of liner projects completed in Massachusetts supplied by the landfill owner and values provided to DEP from consultants who have constructed these types of liners elsewhere in the United States.

The fairly wide range of cost differences presented can be a function of many variables such as the design of the secondary liner (2 feet of clay versus 1 foot of clay and a GCL), the availability of certain materials like clay, the geometry of the site which significantly influences the disposal capacity created, and other factors. Issues like land costs were deliberately left out since that item does not influence liner costs differentially.

The Department believes that the most accurate representation of the true costs associated with the proposed liner revisions is best represented by comparing the incremental cost increase created by the proposed double composite liner to the actual disposal cost for each ton of waste received by the landfill. This information is presented in Table 4 below.

The Department has estimated that the cost of an installed double liner system (based on costs estimated on a national basis) will be approximately \$6.95/ton disposed as compared to \$3.64/ton disposed for a single composite liner (Please note that this cost difference could be less if the values generated for in-state costs were used - \$4.54 versus \$6.68). However, where tipping fees are typically \$75/ton this represents a 4.4% increase in the tipping fee. The added cost will be for materials and construction of the added liner when compared to the current single composite liner standard. Since a typical leak detection and secondary collection system and a primary liner combined are only about one (1) inch thick the cost associated with lost airspace are considered insignificant.

This analysis presents two ways of examining the construction cost differences between composite liners and double composite liners. The Department acknowledges that there may be additional costs for maintenance of a double liner system for such things as instrumentation and

additional pumping equipment to service two (2) leachate collection systems. However, the overall leachate quantity generated by the landfill will not change as a function of the proposed revised liner system. Therefore since the major costs associated with leachate management such as storage, transportation and treatment/disposal will not change, the additional equipment necessary for maintaining a double composite liner system is considered minor. ***The Department welcomes additional comments on this issue.***

Table 3. Comparison of Construction Costs for Composite Liners and Double Composite Liners

Liner Type	Location /date	Size (acres)	Range of cost per acre	Average cost per acre	Average cost for acreage listed	Capacity created (tons of waste disposed)	Liner cost for each ton disposed
Single Composite Liner	Mass/2001	20	\$200,000 - \$225,000	\$212,500	\$4,250,000	935,400	\$4.54
Single Composite Liner	Projects outside Massachusetts	20	\$140,000 - \$200,000	\$170,000	3,400,000	935,400	\$3.64
Double Composite Liner	Mass/2002	16	\$325,000	\$325,000	\$5,200,000	778,000	\$6.68
Double Composite Liner	Mass/2002 (full build-out of project above)	37	\$325,000	\$325,000	\$12,025,000	3,700,000	\$3.25
Double Composite Liner	Project outside Massachusetts	20	\$300,000 to \$350,000	\$325,000	\$6,500,000	935,400	\$6.95

Table 4. Incremental Cost increase of a Single Composite Liner versus a Double Composite Liner for a 20 acre Landfill

Composite liners	Liner cost for each ton disposed	Difference	Typical per ton disposal cost in Massachusetts	Incremental cost of double liner versus a single composite liner on a per ton basis - %
Single composite liner - Projects outside Massachusetts	\$3.63	NA	\$75	NA
Double Composite liner - Projects outside Massachusetts	\$6.95	+\$3.32 additional dollars per ton of waste disposed	\$75	4.4 % (\$75 + \$3.32 = \$78.31)

The Department believes that the incremental cost increase of moving to a double composite liner standard is relatively small and is well justified on the basis of the additional environmental benefits gained from a double composite lined landfill, which far exceed this additional cost. Being able to monitor the collection efficiency of the primary liner system not only tells an operator how well the liner system is working (allowing the operator to take corrective actions if necessary), but also ensures that any leakage through the primary liner will be collected by the secondary liner and not released to the environment. In addition, because the hydraulic head on the secondary liner is designed to be very small, usually around 1 inch, the driving force pushing leachate through the secondary liner is very small. Therefore, very little leachate should ever escape uncontrolled to the environment even in the unlikely event of a leak in the secondary liner. In addition, the secondary liner by itself is a very substantial liner, the design of which is one that is endorsed by EPA regulations and has been an industry standard for more than 10 years.

Another way to look at the benefit of a double composite liner system over a single composite liner system is related to the way contamination can be detected. Under a single composite liner system there is no way to know if the liner is working effectively until it has released leachate to the environment and is detected by the groundwater monitoring system. This may only be discovered after large quantities of leachate have leaked from the landfill for a long period of time. The double composite liner system effectively eliminates this problem because the design, as described above, allows removal of the leachate from the primary liner. Then, if there should be a leak in the primary liner, the leachate will be quickly collected by the secondary liner/collection system (usually within 24 hours). Collection of leachate by the secondary collection system provides information that there may be a problem in the primary liner/collection system, allowing remedial actions if necessary. Also, because of the very low head on that secondary liner, virtually no leachate is likely to escape to the environment.

The benefit of an improved liner design can also be examined from the perspective of groundwater remediation. If groundwater is contaminated due to leakage of leachate it is

possible that some type of remediation will be necessary. Options for groundwater remediation can run from passive capping and closing of the landfill to reduce generation of leachate, with the consequent loss of remaining disposal capacity, to installing active groundwater pump and treat systems. Capping and closure of a landfill as remediation will result in little to no additional cost to the landfill unless the landfill is closed before all remaining disposal capacity is used. In that case lost revenues from tipping fees could be substantial.

Groundwater pump and treat systems can be expensive to install and operate and where used would be installed in addition to capping and closing the landfill and so represents a significant additional cost. Generally such a system will need to be operated for many years. The cost of such a system will include the capital cost to install the system and the operating costs of the system, including collection and treatment of the groundwater that is pumped. One such facility in Massachusetts being installed to treat groundwater contaminated by leachate from an old landfill will cost \$638,000 for installation of the system and the first six months of operation. Operation and maintenance of the system thereafter is expected to be on the order of \$150,000 per year.

5. Ash monofill requirements (19.119)

The major benefit of the proposed elimination of the requirement to dispose of MWC ash only in a monofill will be a reduction in costs to the MWC facility operators. By eliminating the monofill requirement MWC facilities and ash landfill operators will no longer need to maintain separate disposal areas at the landfill, one for ash and one for bypass solid waste. Facility operations can then proceed in a more efficient, lower cost manner compared to maintaining separate areas for MSW and for ash.

6. Landfill operation and maintenance standards (19.130)

The modifications to the operation and maintenance standards should in most cases actually reduce costs for operation of landfills because they provide more flexibility to the operator. Furthermore, several changes were made in recognition that certain practices have been used successfully for many years by operators. For example, allowing ponding of stormwater on the landfill for controlled infiltration and later capture by the leachate collection system has been used at some sites for management of stormwater for several years. Another example is that providing more flexibility on the timing of when intermediate or final cover has to be installed on the landfill may save considerable money for the operator with no loss of protection to health, safety and the environment. For example, the regulations currently require that intermediate cover or final cover be applied to any area of a landfill that will not receive waste for an extended period of time. The proposed modifications to the regulations will now make it clear that installation of final cover over an area that will receive another lift of waste is not required, even if that area won't receive a new lift of waste for an extended period of time. This saves laying down and subsequent tearing up of a final cover where the area will receive waste at a later date.

7. Handling Facility Regulations (19.201 – 19.221)

The additional operation and maintenance requirements and inclusion of some design standards should have little, if any real impact on the costs to permit, construct and operate a solid waste handling facility since the Department has applied these standards for many years and required these operational controls in permits. The primary benefit of including the new standards in the regulations is that it will make the requirements more enforceable.